PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Wang *et al.*

Serial No.: 10/729,804

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Examiner: Madamba, Glenford J.

TKHR Ref: 250338-1500
Client Ref: S-296

For: **CLASS-BASED RATE CONTROL USING MULTI-THRESHOLD LEAKY BUCKET**

REMARKS IN SUPPORT OF PRE-APPEAL BRIEF CONFERENCE

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Commissioner for Patents
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Dear Sir:

Applicants submit the following remarks in support of a Request for a Pre-Appeal Brief Conference. Claims 1-27 are currently pending and subject to a non-final rejection based on the Office Action dated April 14, 2009. Claims 1-8, 11 and 17-23 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Carter et al.* (U.S. Pub. No. 2003/0035374, hereinafter, "*Carter*") in view of *Patel et al.* (U.S. Patent No. 7,126,913, hereinafter "*Patel*") further in view of *Elwalid et al.* (U.S. Patent No. 5,978,356, hereinafter "*Elwalid*"). Claim 16 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Carter* in view of *Patel* further in view of *Lee et al.* (U.S. Patent No. 7,349,403, hereinafter "*Lee*"). Claims 9-10, 12-15 and 24-27 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Carter* in view of *Patel* further in view of *Gracon et al.* (U.S. Patent No. 6,987,732, hereinafter "*Gracon*")

and *Lee*. Applicants respectfully traverse the rejection, and respectfully submit that the rejection of claims 1-27 in the instant application is clearly in error. Among these rejected claims, claims 1, 9, 16, and 24 are independent.

Applicants respectfully submit that independent claim 1 patently defines over *Carter* in view of *Patel* further in view of *Elwalid*. In rejecting claim 1, the Office Action now cites the *Elwalid* reference in place of the previously cited *Aukia* reference (U.S. Patent No. 6,594,268) and alleges that *Elwalid* discloses the features "wherein a size of the leaky bucket is less than or equal to a size of the associated output buffer" and "based on a current token availability level being within a token availability region specifying transmission suppression of packets of the traffic class." (Office Action dated April 14, 2009, pages 5-6). In alleging that *Elwalid* discloses the feature "wherein a size of the leaky bucket is less than or equal to a size of the associated output buffer," the Office Action refers to the parameters related to the Dual Leaky Bucket 16 taught by *Elwalid*. Specifically, the Office Action refers to the three parameters r, B_T, and P. Furthermore, the Examiner emphasizes the fact that the parameter B_T relates to the number of tokens that the token buffer 30 can hold (col. 5, line 16: "The token buffer 30 is capable of holding BT tokens.") and apparently equates this to the "size of the leaky bucket" in claim 1 as the Office Action alleges "*wherein 'B_T' is the leaky bucket 'Token Buffer Size'*." (Office Action, page 5). It is unclear, however, how the cited passage in *Elwalid* teaches the feature "wherein a size of the leaky bucket is less than or equal to a size of the associated output buffer." While the cited passage in *Elwalid* describes a rate r (the rate at which tokens are supplied to the token buffer 30) and that P (the peak rate) is greater than r, nowhere does *Elwalid* teach that B_T (allegedly the "size of the leaky bucket") is less than or equal to a size of the associated output buffer, as recited in claim 1. Applicants note that the parameters P and r relate to token rates. If anything, the P line token buffer 38 taught by *Elwalid*

appears to be more relevant to the output buffer size limitation in claim 1. However, it is unclear what the relationship is between B_T and the size of the P line token buffer 38. In this regard, the newly cited *Elwalid* reference fails to disclose this feature in claim 1. For at least this reason, Applicants respectfully submit that independent claim 1 patently defines over *Carter* in view of *Patel* further in view of *Elwalid*. Furthermore, Applicants submit that dependent claims 2-8 are allowable for at least the reason that these claims depend from an allowable independent claim. *See, e.g., In re Fine*, 837 F. 2d 1071 (Fed. Cir. 1988).

In rejecting independent claim 9, the Office Action maintains the rejections under the combination of *Carter*, *Patel*, *Gracon*, and *Lee*. The Office Action alleges that *Lee* discloses "c. a plurality of packet discard probability registers, each packet discard probability register specifying a probability with which packets of a specific traffic class are to be dropped when a current token availability level is within a token availability region." In doing so, the Office Action continues to refer to the registers 211 depicted in FIG. 2 and to the "drop probability" disclosed by *Lee* in FIG. 37 and to col. 56, lines 22-55, among other text passages. *Lee* teaches of drop probability used in determining whether to discard a packet and further teaches that the information element is discarded based on a drop probability and that the drop probability is calculated according to the equation: drop probability=((average 'information segment storage unit' occupancy-minimum number of occupied 'information segment storage unit' rows)/G)*(I)." (Col. 56, lines 43-47). *Lee*, however, fails to disclose or suggest the registers (211) specifying a probability with which packets of a specific traffic class are to be dropped when a current token availability level is within a token availability region. FIG. 2 shows the processing and context switching occurring in a prior art RISC processor performing networking functions. *Lee* teaches that processes (205) and (207) depicted in FIG. 2 use a common set of registers (211) to store information

specific to that process. Nowhere does *Lee* appear to teach that the registers (211) are related to the drop probability described later in the disclosure. Furthermore, the *Carter*, *Patel*, and *Gracon* references fail to address this deficiency. Claim 9 is thus believed to be patentable. Dependent claims 10-15 are allowable for at least the reason that these claims depend from an allowable independent claim.

Claim 16 recites "wherein the token availability threshold levels correspond to predetermined egress rate control responses to bandwidth utilization with respect to packet traffic classes," and claim 24 recites "wherein the token availability threshold levels correspond to predetermined ingress rate control responses to bandwidth utilization with respect to packet traffic classes." Applicants believe that similar arguments apply in addressing the rejection of these claims.

The Office Action equates the features above in both claims 16 and 24 with "*determining whether 'average usage of a class to which a flow belongs' is equal to, less than, or greater than a minimum/maximum threshold. [Figs. 1-2]"* as taught by *Lee*. (Office Action, pages 11, 20). The Office Action further refers to the accepting or discarding of incoming information elements depicted in FIGS. 34-41. Claim 16 explicitly recites "token availability threshold levels" in addition to "predetermined egress rate control responses." Applicants respectfully submit that these elements are not taught by *Lee*. The token availability threshold levels are used in the context of leaky bucket tracking packet transmissions ("when a current token availability level of a leaky bucket tracking packets is between two token availability threshold levels of a plurality of token availability threshold levels"). Even assuming, for the sake of argument, that the minimum and maximum thresholds cited in the Office Action correspond with the token availability threshold levels in claim 16, for example, *Lee* fails to disclose or suggest token availability threshold levels corresponding to predetermined egress rate control responses to bandwidth utilization. In FIG. 34, the compare unit 966 compares the

average "information segment storage unit" occupancy of a particular class using the average occupancy counter for that class with the maximum number of occupied "information segment storage unit" rows and the minimum number of occupied "information segment storage unit" rows for that class. Based on this, the multiplexer 964 selects as its output a particular one of the inputs (*e.g.*, "always discard"). Applicants submit that is not equivalent to the predetermined egress rate control responses defined in claim 16. For similar reasons, claim 24 is also believed to be patentable. Dependent claims 17-23 and 25-27 are allowable for at least the reason that these claims depend from allowable independent claims. In view of the foregoing, Applicants respectfully request that the rejection of claims 1-27 be withdrawn and prosecution re-opened.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor are hereby authorized to be charged to our Deposit Account No. 20-0778.

Respectfully submitted,

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